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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,676	04/05/2001	Jin-Wen Tzeng	P-1026	3516
7590 06/16/2005 ADVANCED ENERGY TECHNOLOGY INC. 12000 Snow Road Parma, OH 44130			EXAMINER OWENS, DOUGLAS W	
			ART UNIT 2811	PAPER NUMBER

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/826,676	TZENG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Douglas W. Owens	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 14-20 and 24-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24-29 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-10, 12 and 14-20 is/are rejected.
- 7) ☒ Claim(s) 6 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 10, 2005 has been entered.

### ***Claim Objections***

2. Claims 1 – 9 are objected to because of the following informalities:

In line 2 of claim 1, "particle" should be replaced with --particles--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 – 3, 5, 7, 10, 12 and 15, 16 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,194,685 to Rutherford.

Regarding claim 1, Rutherford teaches an isolated thermal interface (Fig. 5, for example) comprising a sheet of compressed particles of exfoliated graphite (20; Col. 5, line 56 – Col. 6, line 14), the sheet having two major surfaces, the major surfaces being coated with a protective coating (22, 24) sufficient to inhibit flaking of the particles of graphite.

Regarding claim 2, Rutherford teaches an isolated thermal interface, wherein the protective coating comprises a thermoplastic material (Col. 6, lines 54 – 59).

Regarding claim 3, Rutherford teaches an isolated thermal interface, wherein the thermoplastic comprises a polyimide (Col. 6, lines 54 – 59).

Regarding claim 5, Rutherford teaches a thermal interface, wherein the protective coating (24) is effective to electrically isolate the coated major surface of the sheet (Col. 6, lines 7 – 11).

Regarding claim 7, Rutherford teaches a thermal interface, which further comprises a layer of adhesive (Col. 7, lines 30 – 35) interposed between the protective coating and the sheet.

Regarding claim 10, Rutherford teaches a process for producing a thermal interface having a protective coating sufficient to inhibit flaking of the particles of graphite, the process comprising:

forming a sheet comprising compressed particles of exfoliated graphite (20; Col. 5, line 56 – Col. 6, line 14) into the size and shape desired for a thermal interface, wherein the formed sheet has two major surfaces and at least one edge surface, and

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wherein the sheet has its directions of greater thermal conductivity parallel to the major surface; and

coating the major surfaces of the formed sheet with a material to form a protective coating (22, 24), such that the material forms a protective boundary about the sheet.

Regarding claim 12, Rutherford teaches a process, wherein the material is coated on the formed sheet by hot laminating press (Col. 7, lines 17 – 20).

Regarding claims 15 and 16, Rutherford teaches a process, wherein material comprises a thermoplastic material comprising a polyimide (Col. 6, lines 54 – 59).

Regarding claim 18, Rutherford teaches a process, wherein an adhesive is coated on the formed sheet between the material and the formed sheet (Col. 7, lines 30 – 35).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4, 8, 9, 14, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rutherford.

Regarding claim 4, Rutherford teaches a thermal interface, wherein the protective coating has a thickness of 0.0254 mm (0.001 inches; Col. 6, lines 47 – 52), which abuts the claimed range. It has been held that a *prima facie* case of obviousness

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exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.).

Regarding claim 8, Rutherford does not teach a thermal interface wherein the adhesive is selected from the group consisting of acrylic and latex materials. Acrylic and latex adhesives are known in the art and it would have been obvious to one having ordinary skill at the time the invention was made to use known adhesives, since it is desirable to employ the use of reliable materials. Moreover, the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Regarding claim 9, Rutherford does not teach a thermal interface, wherein the thickness of the adhesive is no more than 0.015 millimeters. Rutherford is silent with respect to the thickness of the thermal interface. It would have been obvious to one having ordinary skill in the art to arrive at the optimal thickness through routine experimentation. Additionally, "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 14, Rutherford teaches a process including hot press laminating. Rutherford does not disclose cutting the sheet after the laminating step, nor does Rutherford disclose cutting the sheet before the laminating step. It is apparent that the sheet is cut at some point in the process. It would have been obvious to one having ordinary skill in the art to cut the sheet, since it is desirable for the sheet to have the design shape. It has been held that the selection of any order of process steps is *prima facie* obvious in the absence of new or unexpected results. See *Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render *prima facie* obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946).

Regarding claim 17, Rutherford teach a process wherein the protective coating has a thickness of 0.0254 mm (0.001 inches; Col. 6, lines 47 – 52), which abuts the claimed range. It has been held that a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties.

Regarding claim 19, Rutherford does not teach a process wherein the adhesive is selected from the group consisting of acrylic and latex materials. Acrylic and latex adhesives are known in the art and it would have been obvious to one having ordinary skill at the time the invention was made to use known adhesives, since it is desirable to

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employ the use of reliable materials. Moreover, the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Regarding claim 20, Rutherford does not teach a process wherein the thickness of the adhesive is no more than 0.015 millimeters. Rutherford is silent with respect to the thickness of the thermal interface. It would have been obvious to one having ordinary skill in the art to arrive at the optimal thickness through routine experimentation. Additionally, "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

#### ***Allowable Subject Matter***

7. Claims 24 – 29 are allowed.
8. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
9. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach, alone or in combination, an electronic device with "...one of the major surfaces being in contact with the electronic component and the other of the major surfaces coated with a protective coating...".

#### ***Response to Arguments***

10. Applicant's arguments with respect to claims 1 – 12 and 14 – 20 have been considered but are moot in view of the new ground(s) of rejection.



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W. Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Douglas W Owens  
Examiner  
Art Unit 2811

DWO